

PROVIDING UP TO DATE CARE FOR PEOPLE WITH DIABETES

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WHAT IS DIABETES?

'A metabolic disease with hyperglycaemia resulting from defects in insulin secretion or insufficient insulin or insulin action for the body's need'

- NSF

- nGMS

- NICE

MAIN TYPES OF DIABETES

TYPE 1

- Approx 15% of Diabetes
- Autoimmune disease that destroys beta cells in the pancreas
- Usually children/young adults

TYPE 2

- Approx 85% of Diabetes
- Insulin deficiency/ Insulin resistance
- Strong link with obesity
- No longer only 'a disease of the middle aged/ elderly'

GENETIC VARIATIONS

MODY (Maturity Onset Diabetes of the Young)

- Diabetes before age of 25 yrs
- Accounts for 1-2% of Diabetes
- Runs in families
- Rx diet/ tablets (Sulphonylureas) usually not requiring insulin

LADA (Latent Autoimmune Diabetes of Adulthood)

- A slowly progressing auto-immune form of Diabetes
- Also known as T1.5DM
- Occurs at any age
- Often masquerades as T2DM

WHY SHOULD WE BE CONCERNED?



- Worldwide 171 million- predicted 366 million by 2030
- Accounts for 8% of total NHS expenditure
- Most common cause of blindness in adults
- Accounts for half of all lower limb amputations
- Single largest cause of renal failure

CARDIOVASCULAR RISK

‘The risk of developing cardiovascular disease, which is a combination of the risks for developing CHD, cerebrovascular and peripheral vascular disease’

- Risk of CVA increased 2 fold
- Risk of CVD increased 2-3 fold in men & 4-5 fold in women

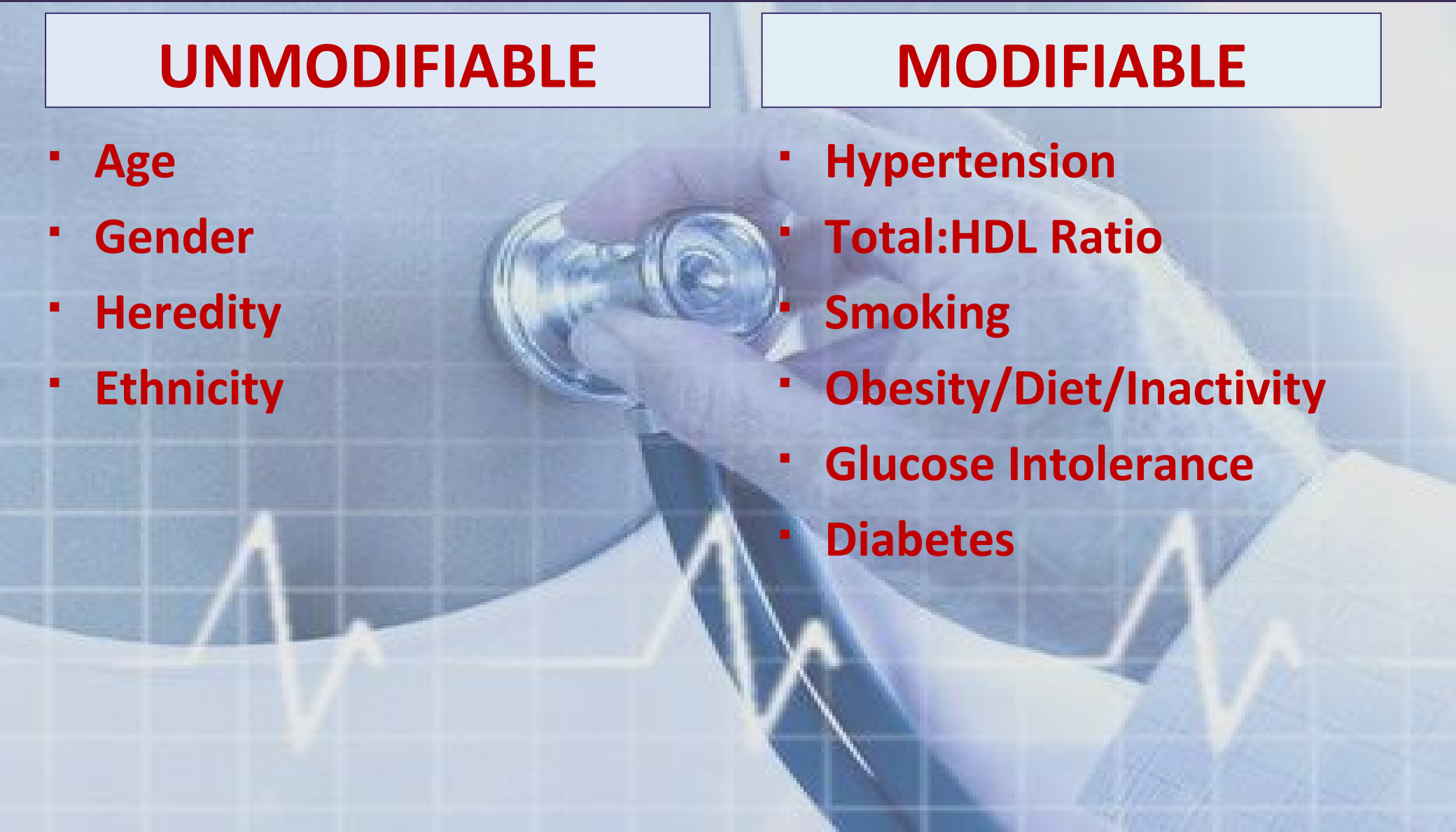
CARDIOVASCULAR RISK FACTORS

UNMODIFIABLE

- Age
- Gender
- Heredity
- Ethnicity

MODIFIABLE

- Hypertension
- Total:HDL Ratio
- Smoking
- Obesity/Diet/Inactivity
- Glucose Intolerance
- Diabetes



RISK FACTORS- T2DM

- Aging
- Family History
- Ethnicity
- Gestational Diabetes
- PCOS

- IGT/IFG
- Obesity
- Sedentary lifestyle
- Hypertension
- Dyslipidaemia



METABOLIC SYNDROME (IDF)

CLUSTER OF RISK FACTORS FOR CVD, T2DM & LIVER DISEASE

CENTRAL OBESITY

Waist circumference:

Europeans- Men $\geq 94\text{cm}$, Women $\geq 80\text{cm}$

S. Asians- men $\geq 90\text{cm}$, Women $\geq 80\text{cm}$

FASTING BLOOD GLUCOSE

$> 5.6 \text{ mmol/l}$ or previously diagnosed T2DM

BLOOD PRESSURE

$\geq 130/65$ or receiving treatment

TRIGLYCERIDES (FASTING)

$\geq 1.7 \text{ mmol/l}$ or receiving specific treatment

HDL CHOLESTEROL

Men $< 1\text{mmol/l}$

Women $< 1.3 \text{ mmol/l}$ or receiving specific treatment

ORAL GLUCOSE TOLERANCE TEST

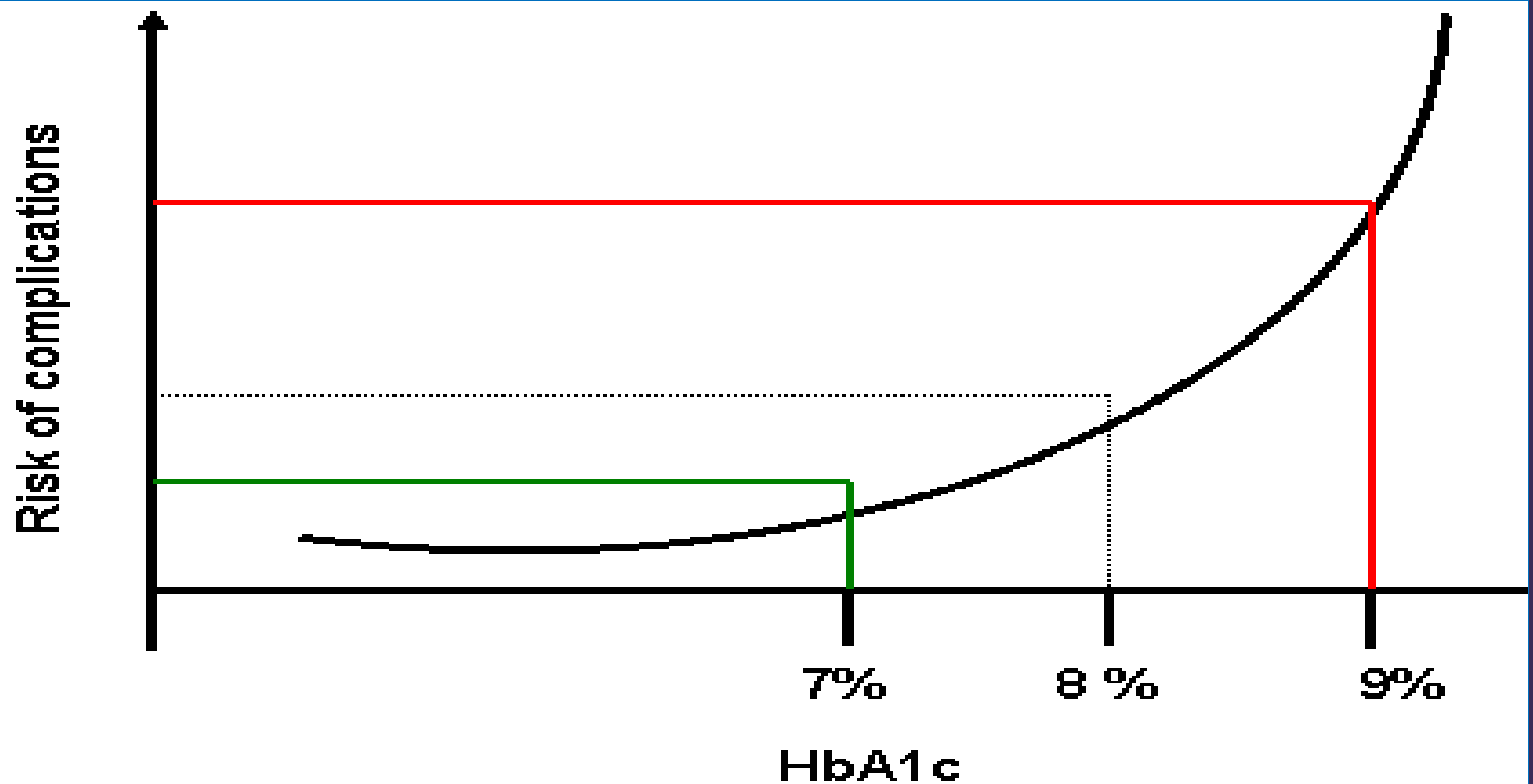
DIABETES MELLITUS	FBG ≥ 7.0 mmol/l <u>OR</u> 2-hour OGTT ≥ 11.1 mmol/l
IMPAIRED GLUCOSE TOLERANCE (IGT) UP TO 50% PROGRESS TO T2DM IN 2 YEARS	FBG < 7 mmol/l <u>AND</u> 2-hour OGTT plasma venous glucose ≥ 7.8 mmol/l and < 11.1 mmol/l
IMPAIRED FASTING GLUCOSE (IFG) INCREASED RISK OF T2DM & CVD	FBG 6.1–6.9 mmol/l <u>AND</u> 2-hour OGTT plasma venous glucose < 7.8 mmol/l

**10% WEIGHT LOSS REDUCES RISK
OF T2DM BY 60%**

HbA1c

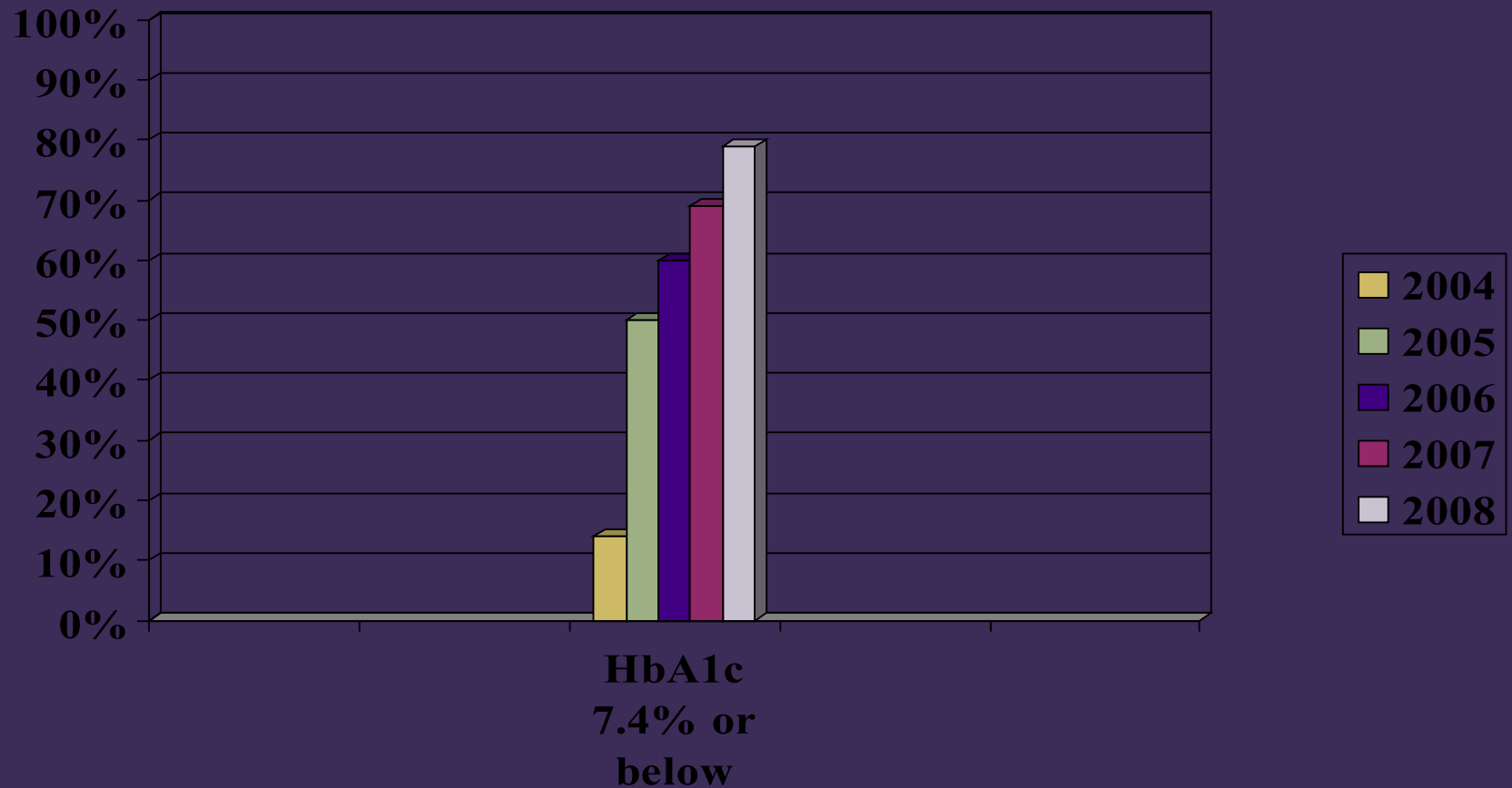
HbA1c (%)	AVERAGE BLOOD GLUCOSE (mmol/l)
13	18
12	17
11	16
10	13
9	12
8	10
7	8
6	7

EFFECT OF POOR GLYCAEMIC CONTROL



DIABETES OUTCOMES

MANOR SURGERY



LIFESTYLE

Always the 1st line approach!

- Increasing activity
- Diet/Weight loss
- Alcohol
- Smoking

- Individual patient records
- Diabetes2gether
- Diabetes UK

- Assess level of motivation to change
- Set goal for next visit



SMART GOALS



Specific

Measurable

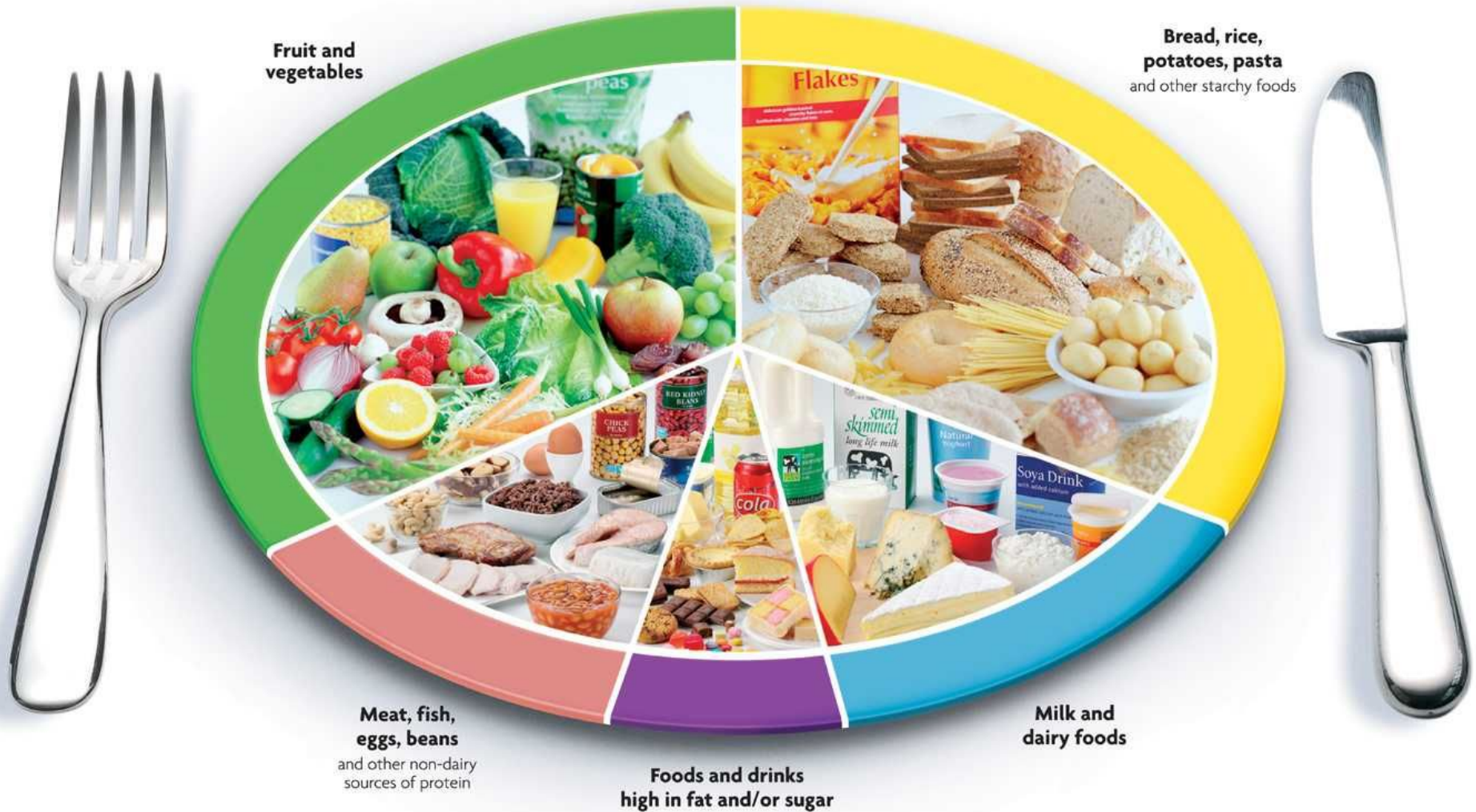
Attainable

Realistic

Timescale

The eatwell plate

Use the eatwell plate to help you get the balance right. It shows how much of what you eat should come from each food group.



ORAL TREATMENT-T2DM

BIGUANIDES-METFORMIN

- Improves insulin sensitivity
- Cardio protective
- Weight neutral
- If tolerated increase dose over 1-3 mths to 2g/day
- Frequent GI effects -> try MR version



- **Beware Lactic Acidosis**
- **Review if plasma creatinine > 130 or eGF <45ml/min**
- **Stop if plasma creatinine > 150 or eGFR <30ml/min**

ORAL TREATMENT-T2DM

SULPHONYLUREAS

- Gliclazide-start 80mg od & increase monthly
- MR version as effective and provides better profile for elderly
- Weight gain
- Risk of hypoglycaemia
- Check LFTs



ORAL TREATMENT-T2DM

THIAZOLIDINEDIONES (TZDs)

Improve insulin sensitivity

Rosiglitazone- Increased risk of MI by 43% & HF by 60%

Pioglitazone- Reduced risk of death from MI/CVA by 5%.

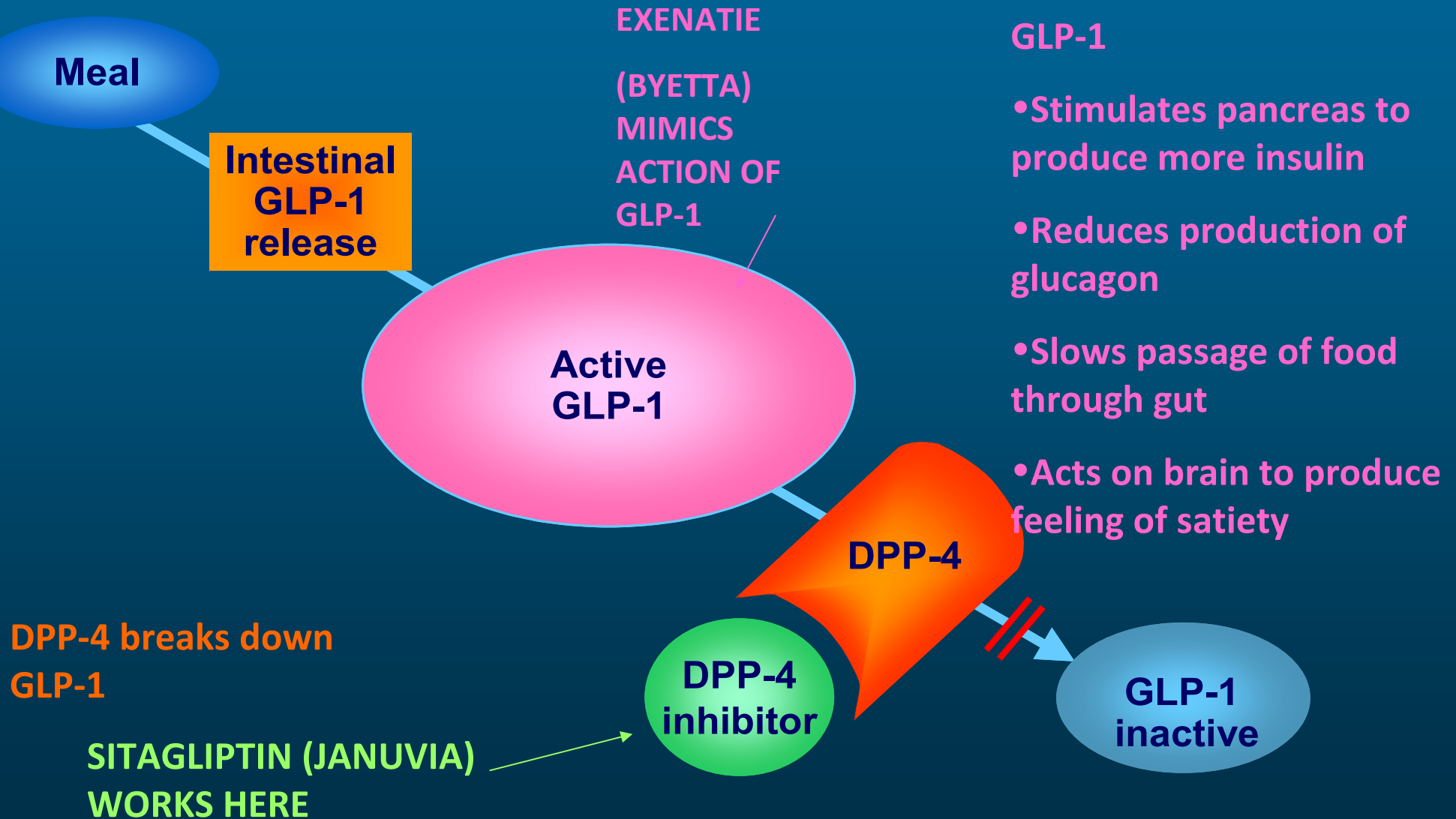
Improves lipid profile & reduces intracoronary risk

CAUTIONS:

- Cause fluid retention
- Weight gain
- Expensive
- Increased risk long bone #



NEW AGE OF INCRETIN MIMETIC DRUGS



SITAGLIPTIN/VILDAGLIPTIN (DPP-4 Inhibitor)

- Use with Metformin/SU or Glitazone
- 100mg daily
- Possible nausea
- Associated weight loss
- Caution with renal impairment



EXENATIDE (BYETTA)

(Mimics GLP-1)



Consider as option only if:

- Body mass > 35 (adjust for ethnic minorities) &
- Has HbA1c $\geq 7.5\%$ on Metformin/SU &
- Would otherwise start high cost medication such as Glitazone or Insulin

- **Glitazones contraindicated**
- **S/E Nausea/vomiting**



COST COMPARISON

DRUG	MONTHLY COST-MAXIMUM DOSE
Metformin	£6.40
Metformin MR (500mg tabs)	£12.80
Metformin/Pioglitazone	£35.54
Gliclazide	£2.24
Gliclazide MR	£12.24
Pioglitazone	£36.96
Sitagliptin	£33.26

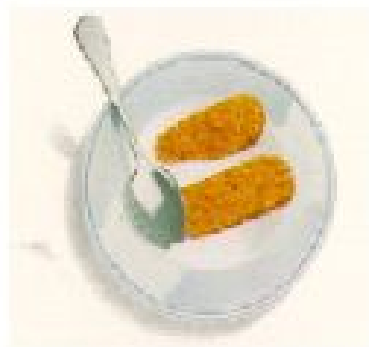
BLOOD GLUCOSE TESTING

“There is no evidence that blood glucose monitoring improves glycaemic control in people with T2DM not using insulin” (NICE, 2008)

- Costs account for 27% of total diabetes prescribing
- Patient ‘Empowerment’
- Should be used correctly
- Blood ketone testing



NORMAL INSULIN PROFILES



Breakfast



Lunch



Evening Meal

Blood sugar

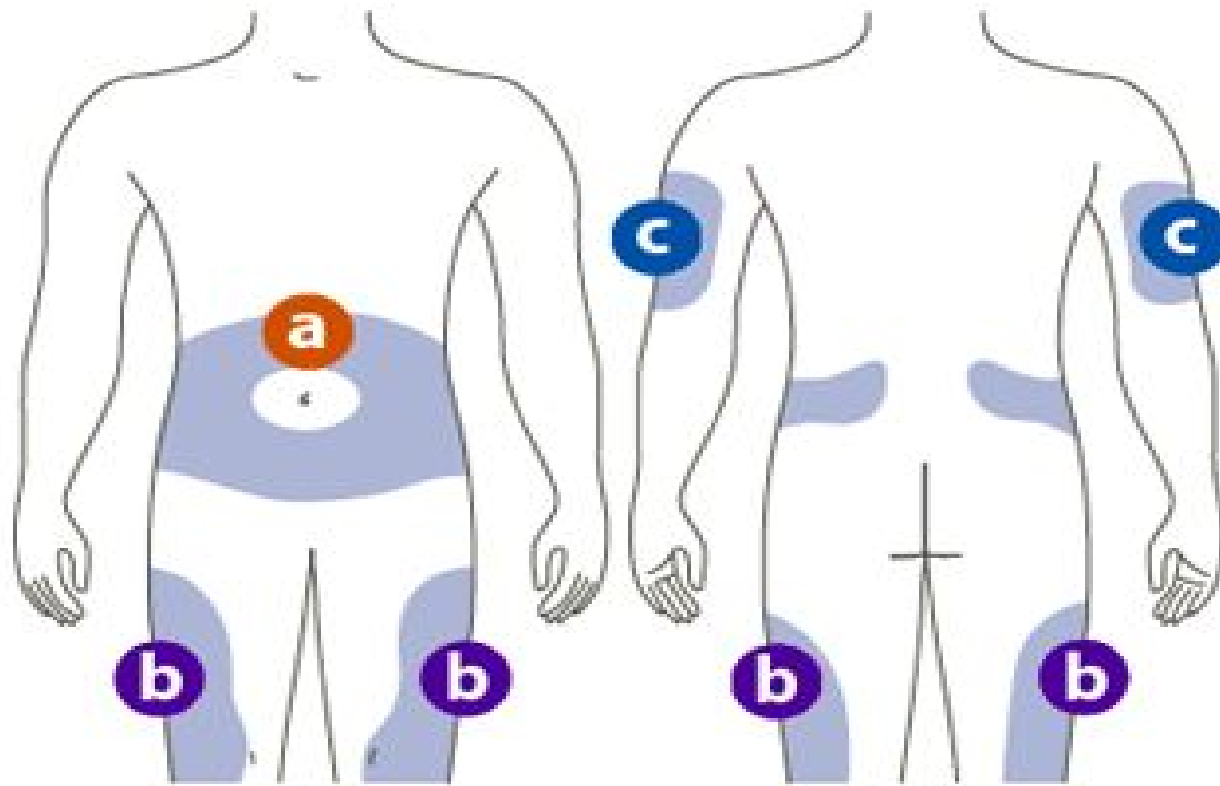
Mealtime insulin

Background/basal insulin

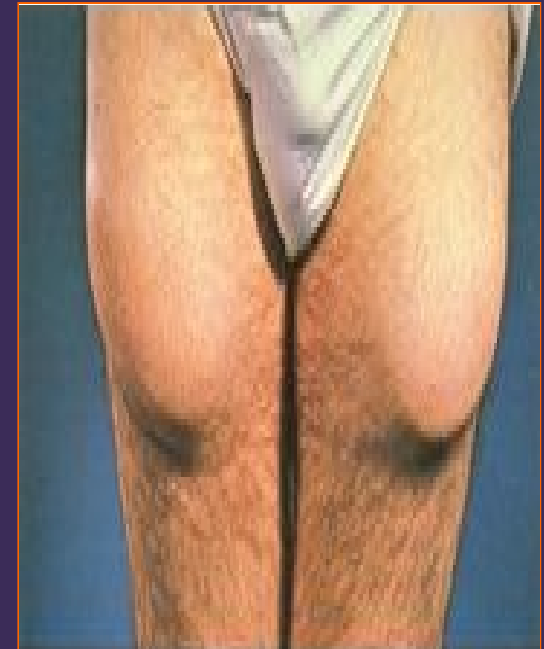
INSULIN NEEDS TO:

- Replace the background (basal) insulin
- Replace the mealtime (bolus) insulin
- Replace both

SITE ROTATION



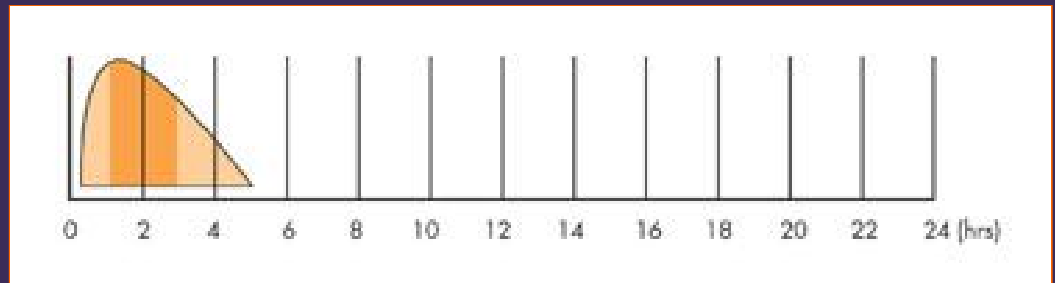
Recommended injection sites



SHORT/RAPID ACTING

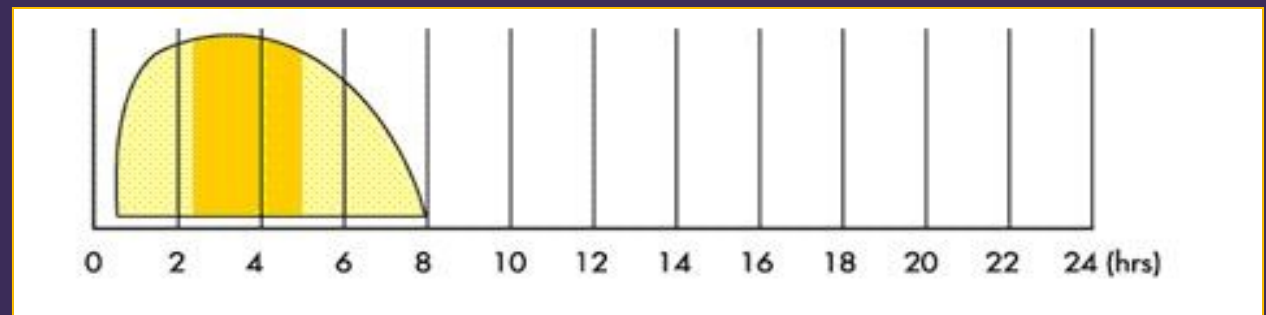
Rapid acting:

- Novorapid or Humalog
- Onset-immediate
- Peak 1-2 hrs
- Duration 3-5 hrs



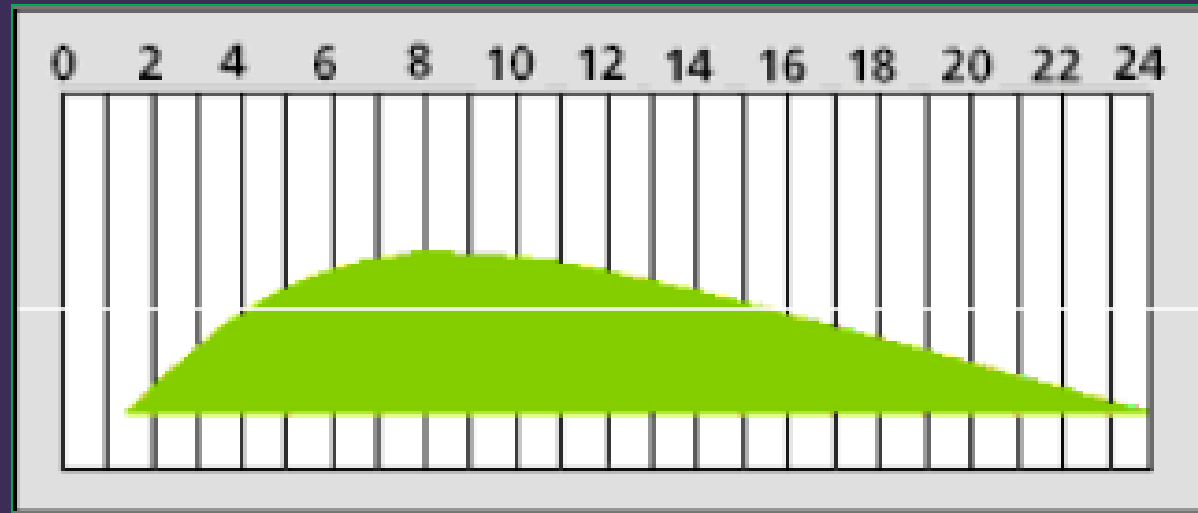
Short acting:

- Humulin S
- Onset: 30mins
- Peak: 1-3 hrs
- Duration: up to 8hrs

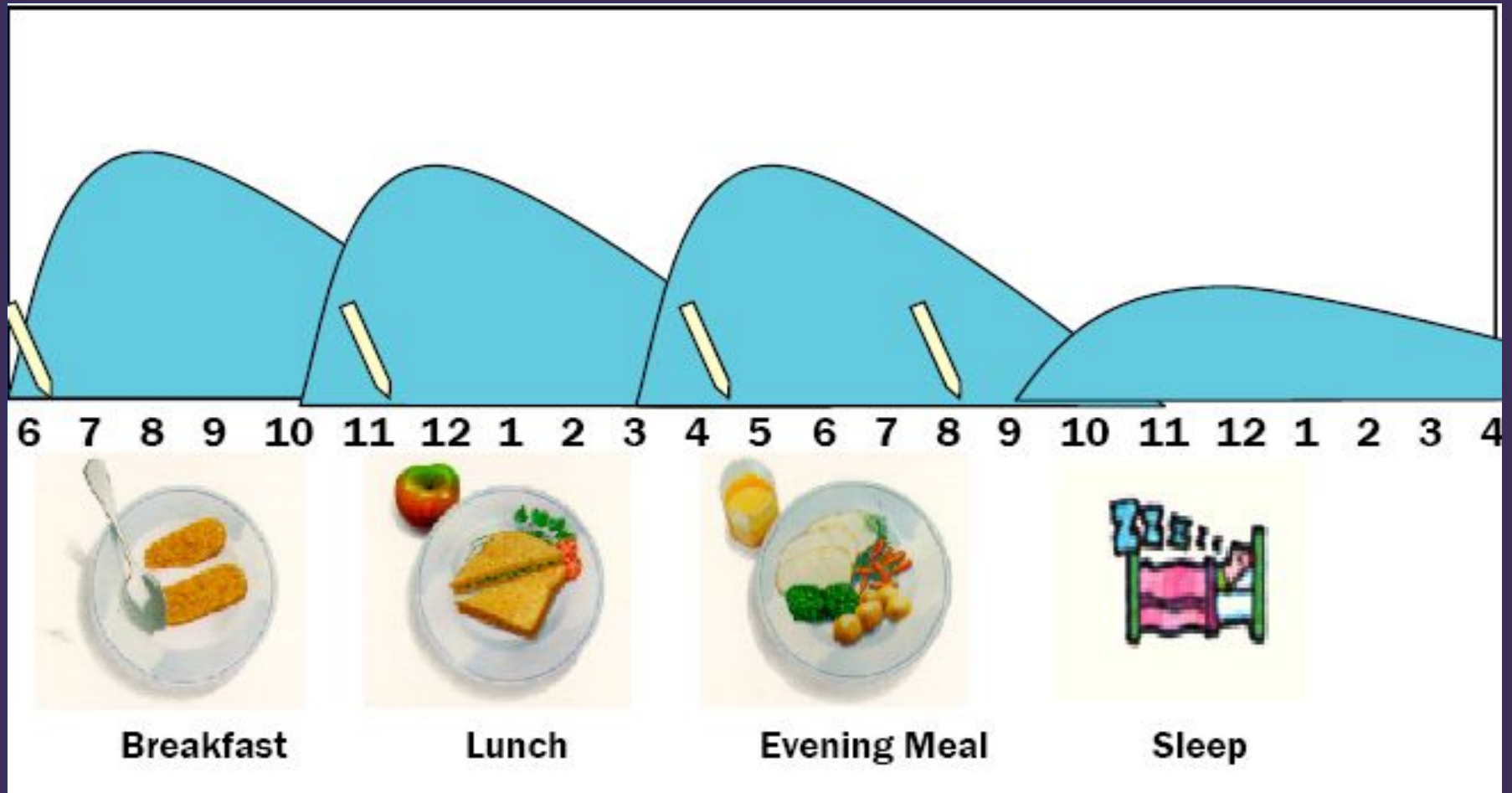


INTERMEDIATE ACTING INSULIN

- Insulatard; Humulin I
- Cloudy
- Onset 1.5 hrs
- Peak 4-12 hrs
- Duration up to 12 hrs



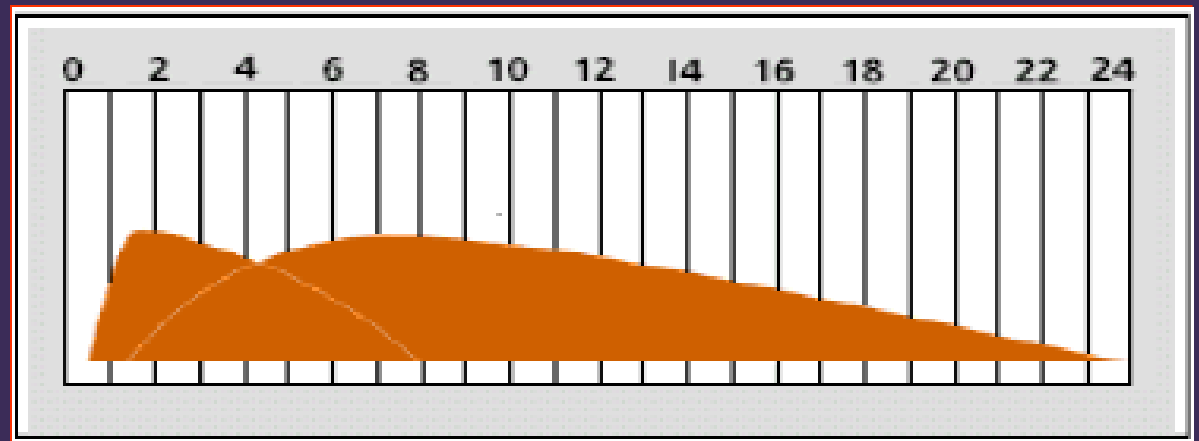
BASAL BOLUS



PRE-MIXED INSULIN

Now limited to:

- Mixtard30; Humulin M3; Humalog Mix 25; Humalog Mix 50 Novomix 30
- Cloudy
- Onset 30 mins
- Peak 2-8 hrs
- Duration up to 24hrs



LONG ACTING BASAL ANALOGUE INSULINS

Lantus (Glargine)

- Lasts approx 20-24 hrs



Levemir (Detemir)

- Lasts approx 15-20 hrs
- Better with weight gain



SICK DAY RULES

DO NOT STOP INSULIN!!!

- 4 hrly BG monitoring
- Stop Metformin
- Check blood ketones
- Maintain carbs with fruit juice/sugary drinks
- Add in 10-20% extra short acting insulin if BG >16

RED FLAGS



- Inability to swallow/keep down fluids
- Persistent diarrhoea
- BG > 20 despite best therapy
- Blood ketones > 3.0
- Those living alone

COMPLICATIONS

TYPE 1

Tend to be microvascular:

- Retinopathy
- Diabetic Nephropathy
- Diabetic Neuropathy

TYPE 2

Tend to be macrovascular:

- CHD
- CVA

UKPDS

Improved glycaemic control reduces:

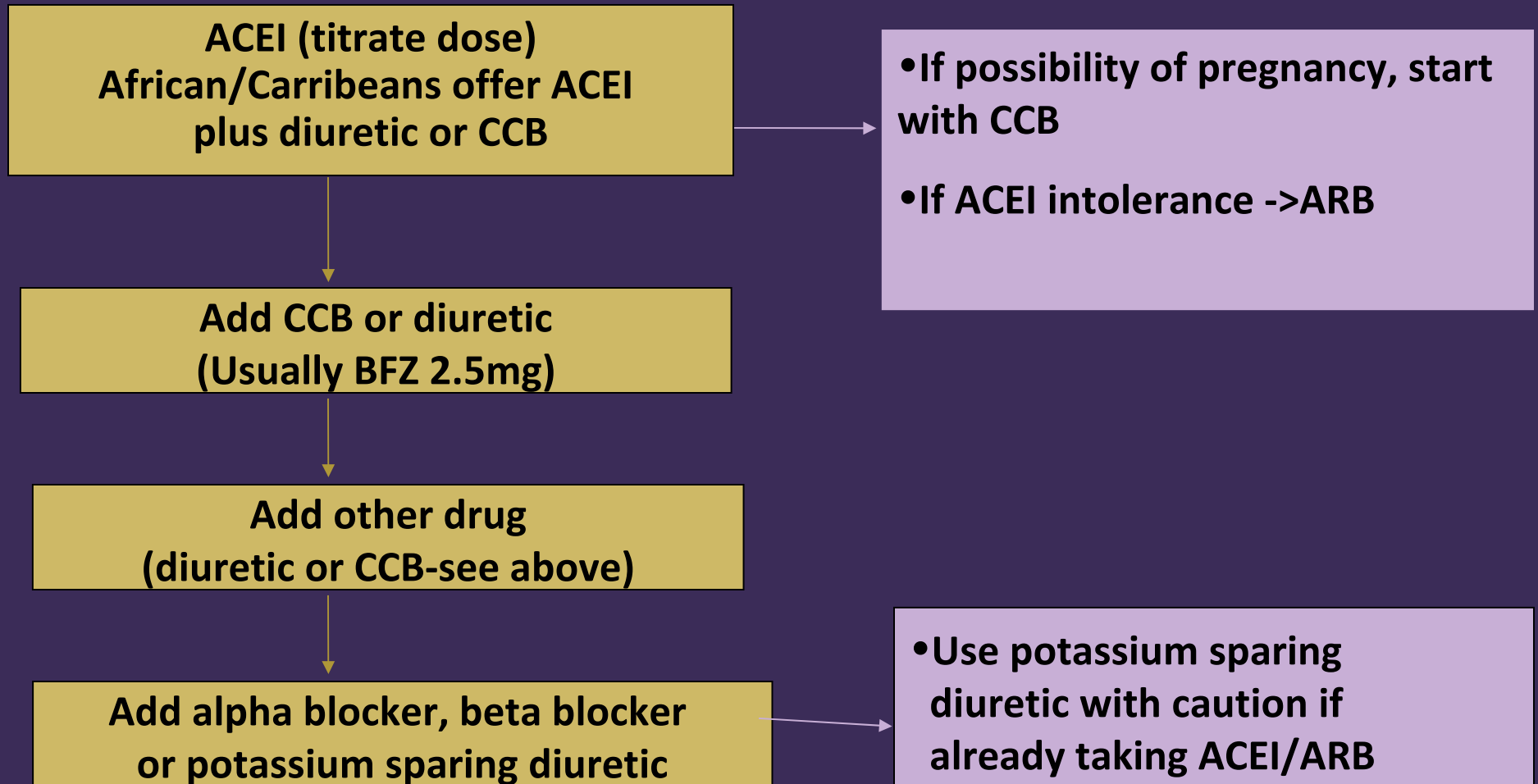
- Diabetic eye disease by 1/3
- Early kidney damage by 1/3

Improved BP control reduces:

- Death from long term complications by 1/3
- CVA by 1/3
- Eye complications by 1/3

BLOOD PRESSURE NICE GUIDANCE

- NICE- 140/80
(with nephropathy 130/70)
- QOF 145/85



MICROALBUMINURIA

Microalbumin/creatinine
Ratio (ACR)

(Ranges-men <2.5 women <3.5)

EMU-best of 2 if 1st positive

**PROGNOSTIC INDICATOR
OF CVD IN T2DM &
DIABETIC NEPHROPATHY
IN T1DM/T2DM**

Factors that may
increase ratio

- Short term raised BG
- Exercise
- UTI
- Marked hypertension
- Heart failure
- Acute febrile illness

MANAGEMENT

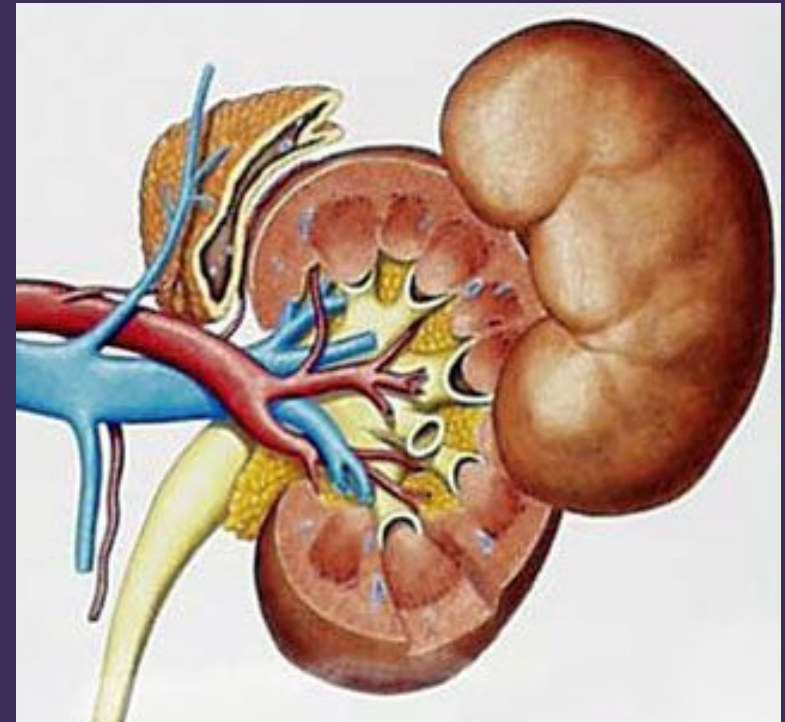
- Check trend of plasma creatinine & eGFR
- Start ACEI/ARB & titrate up to highest tolerated dose
- Re-measure ACR at least 6 monthly
- Aim for tight glycaemic control
- Measure, assess and manage CVD risk factors aggressively

KIDNEYS

Diabetic nephropathy occurs in up to 30% of people with Diabetes

CVD risk is increased so aim to:

- Treat BP to $< 130/70$
- Get HbA1c $< 7\%$
- Get TC < 3.5
- Rx with ACEI/ARB
- Reduce salt/alcohol intake
- Stop smoking-**VITAL**



LIPIDS

NICE GUIDANCE

Consider to be at high risk
unless ALL of following
apply:

- Not overweight
- No microalbuminuria
- Non-smoker
- No high risk lipid profile
- No history CVD
- No FH CVD



LIPID LOWERING THERAPY

NICE GUIDANCE

Use Simvastatin 40mg & aim for:

- TC < 4.0 mmol/l
- HDL $\leq$ 1.4 mmol/l OR
- LDL < 2.0 mmol/l

**If above these then
increase to 80mg
Simvastatin / add
in Ezetimibe or swap to
Atorvastatin**

Fibrates:

Add in if TG=2.3-4.5mmol/l

Nicotinic Acid:

Only on 2ndry care initiation

Omega 3 Fish oils

Do not prescribe for primary prevention unless advised by 2ndry care

ASPIRIN

NICE GUIDANCE

Recommended for:

- Age 50+ yrs and BP <145/90
- Age < 50 yrs and significant other CVD risk factors



“An aspirin a day will help prevent a heart attack if you have it for lunch instead of a cheeseburger.”

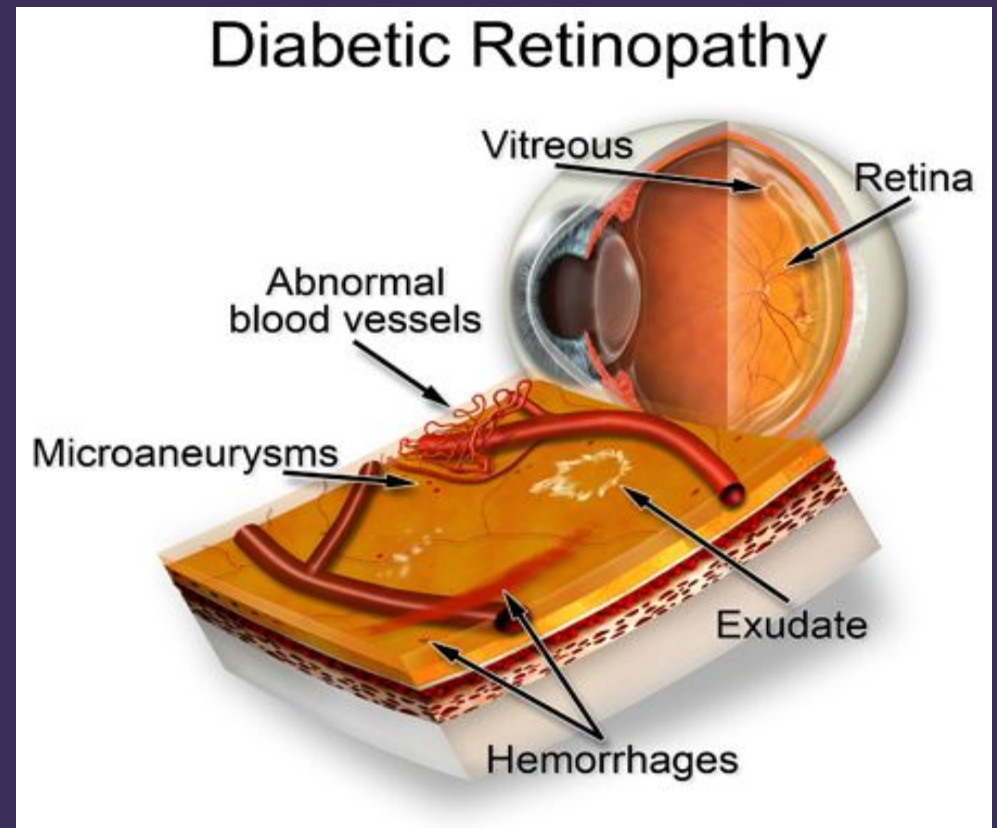
DIABETIC EYE DISEASE

Raised blood glucose levels can cause:

- Diabetic Retinopathy
- Blurred vision

Also result in increased likelihood of:

- Cataracts
- Glaucoma
- Occular Nerve Palsies



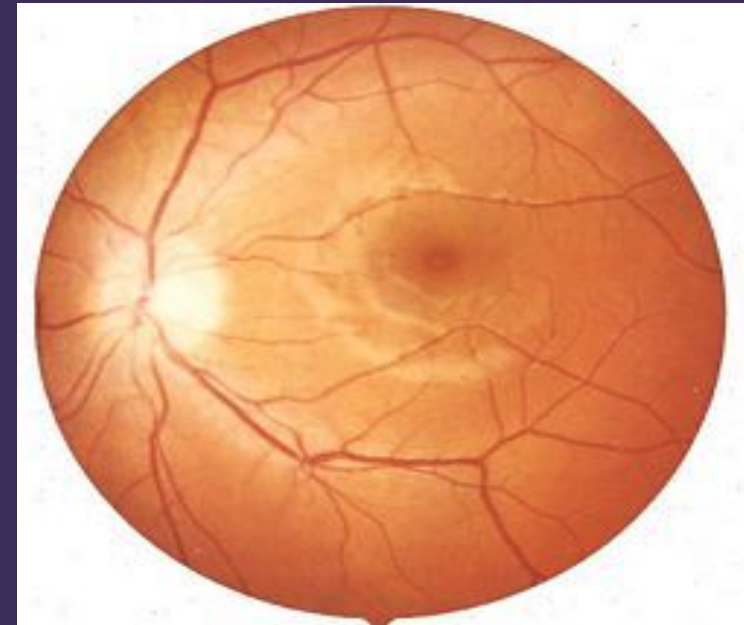
RETINAL SCREENING

Oxfordshire Diabetic Eye Screening Service (ODESS)

- All patients must have personal number
- No real provision for housebound

Laser Treatment suitable for:

- Proliferative Diabetic Retinopathy
- Diabetic Macular Oedema

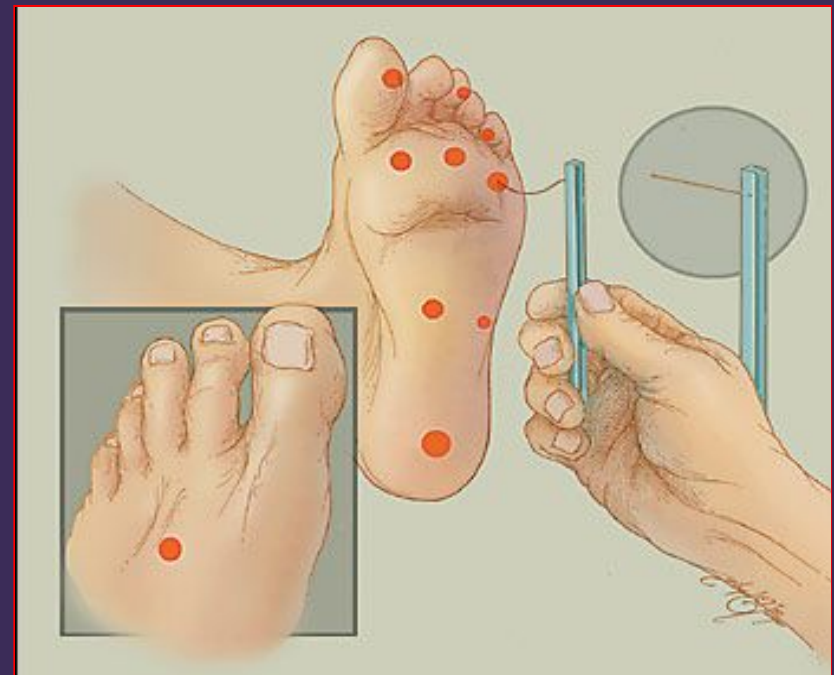


NEUROPATHY

Increases with:

- Age and duration of Diabetes
- Poor glycaemic control
- Smoking
- Presence of other diabetes related complications

- **Pain may be helped by:**
- Amitriptyline
- Carbamazepine
- Gabapentin/Pregabalin
- Duloxetine



ERECTILE DYSFUNCTION

Affects up to 75% of men
with Diabetes

Often aggravated by:

- Overweight
- Smoking
- Alcohol
- Lack of exercise
- Some medicines

IF WE DON'T ASK,
PATIENTS WON'T TELL

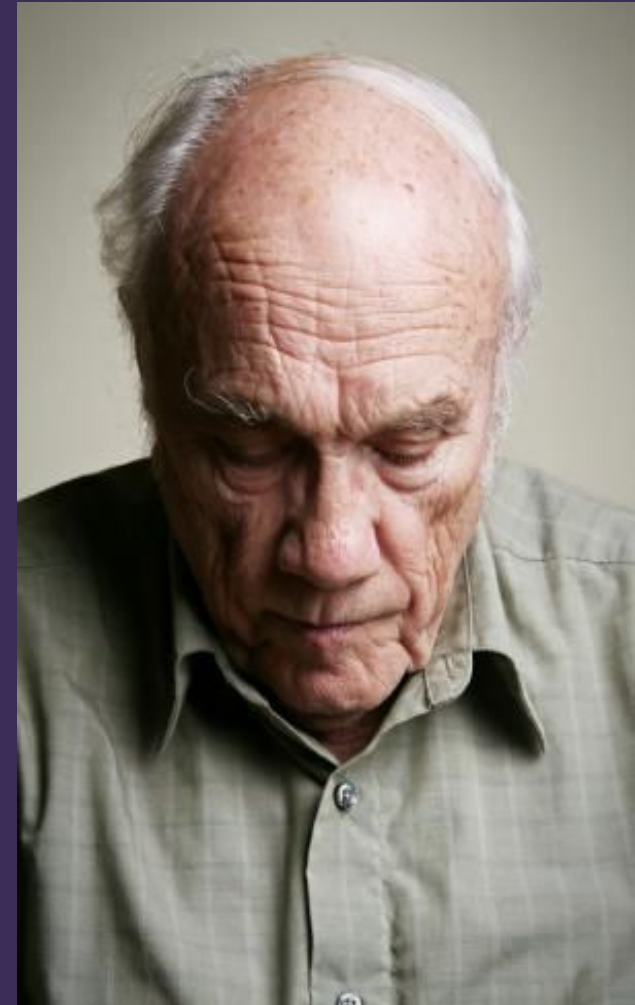


DEPRESSION

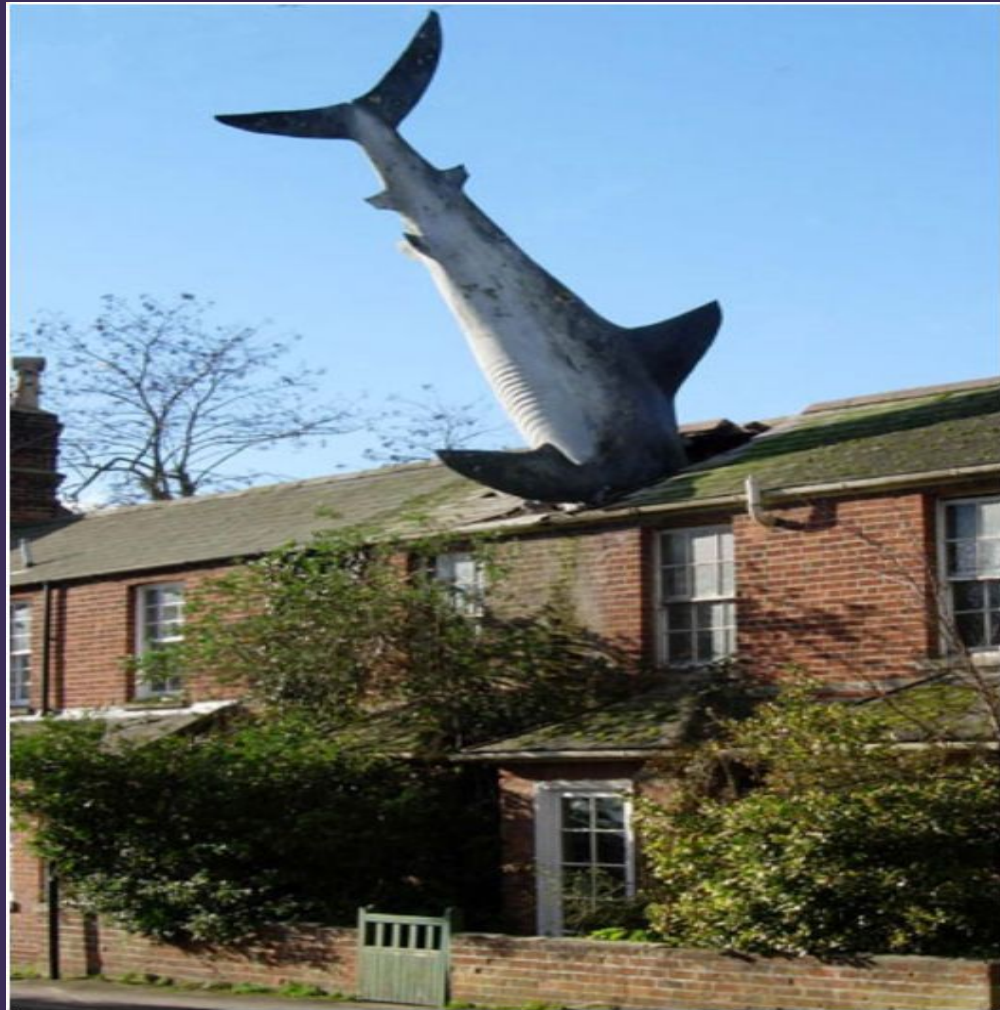
- Increases risk of depression by 50%
- Depression increases risk of Diabetes
- Having both increases risk of Diabetes complications
- Impacts on glycaemic control & quality of life

Assessment:

- Structured approach
- PHQ -9 if +ve NICE/QOF response



HOUSEBOUND PATIENTS

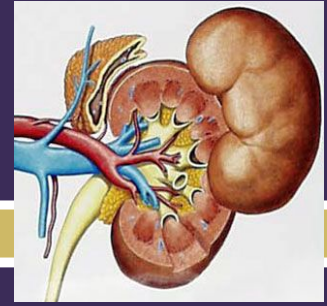


THANK YOU !!

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CHRONIC KIDNEY DISEASE (CKD)



- Diabetes causes scarring in filtering section of kidney
- Up to 1:10 adult population
- Over 75yrs = 1:2
- Lose 2/3 of remaining life years
- Most common cause = hypertension

GRADE	GFR ml/min	CONSEQUENCE
CKD 3	30-59	Moderately reduced GFR

AUTONOMIC NEUROPATHY

**Damage to autonomic nerves that supply
Variety of internal organs:**

- Gastroparesis
- Erectile Dysfunction
- Sweating
- Unexplained diarrhoea
- Unexplained bladder emptying problems

HYPERGLYCAEMIA

Diabetic Ketoacidosis (DKA)

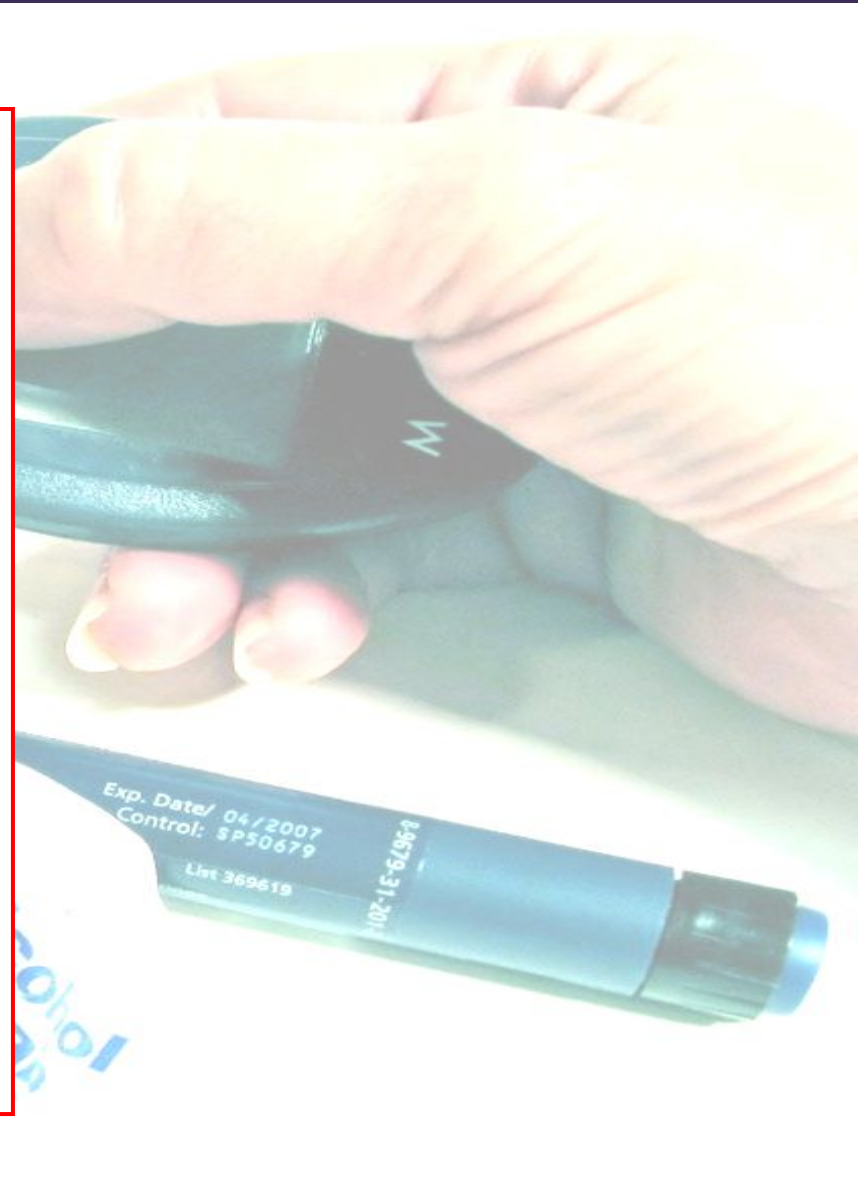
- Inadequate insulin levels cause cells to use fat reserves
- Ketones are by-products
- High risk of cerebral oedema

Hyperosmolar Non-Ketotic Acidosis (HONK)

- Mainly in older people with T2DM
- Blood glucose v high
- No acidosis
- High risk of dehydration
- Death rate up to 58%

WHAT TO CHECK

- Type of insulin
- Fasting and post prandial BG
- ? Hypos
- Injection sites
- Injection technique
- Length of needle



DELIVERY DEVICES

- First choose the most suitable insulin for the Patient
- Then let them choose their preferred delivery device
- Pens come in reusable and disposable

